

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Claim 1 (Previously Presented): A chiral nematic liquid crystal optical element, comprising:

a pair of substrates with transparent electrodes; and
a liquid crystal layer having a memory property interposed between the substrates;
a first resin layer which is provided on one of the transparent electrodes,
said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer;
a non-alignment layer of a second resin layer, a vertical alignment layer of a second resin layer or a horizontal alignment layer of a second resin layer which is provided between the liquid crystal layer and the other of the transparent electrodes;
wherein said liquid crystal layer exhibits a planar state and a focal conic state.

Claim 2 (Original): The liquid crystal optical element according to Claim 1, wherein the first resin layer is provided only on the substrate on a side opposite to an observing side.

Claim 3 (Previously Presented): The liquid crystal optical element according to Claim 1, wherein the second resin layer has a surface hardness of B or less in a pencil hardness test.

Claim 4 (Previously Presented): The liquid crystal optical element according to Claim 2, wherein the other electrode has a second resin layer provided thereon, the second resin layer has a surface hardness of B or less in a pencil hardness test.

Claim 5 (Previously Presented): A chiral nematic liquid crystal optical element, comprising:

- a pair of substrates with transparent electrodes; and
- a liquid crystal layer having a memory property interposed between the substrates;
- a metal-oxide layer provided on at least one of the transparent electrodes;
- a first resin layer which is provided on one of the transparent electrodes,
- said first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer;
- a non-alignment layer of a second resin layer, a vertical alignment layer of a second resin layer or a horizontal alignment layer of a second resin layer which is provided between the liquid crystal layer and the other of the transparent electrodes;
- wherein said liquid crystal layer exhibits a planar state and a focal conic state.

Claim 6 (Original): The liquid crystal optical element according to Claim 5, wherein the paired transparent electrodes have a drive voltage of 20V or less applied thereacross.

Claim 7 (Previously Presented): The liquid crystal optical element according to Claim 5, wherein the second resin layer has a surface hardness of B or less in terms of a pencil hardness test.

Claim 8 (Previously Presented): The liquid crystal optical element according to Claim 6, wherein the second resin layer has a surface hardness of B or less in a pencil hardness test.

Claim 9 (Canceled):

Claim 10 (Canceled)

Claim 11 (Previously Presented) The liquid crystal optical element according to Claim 1, wherein said focal conic state produces a scattering of incident light.

Claim 12 (Previously Presented) The liquid crystal optical element according to Claim 1, wherein said planar state produces a selective reflection of incident light.

Claim 13 (Previously Presented) The liquid crystal optical element according to Claim 1, which is a color display.

Claim 14 (Previously Presented) The liquid crystal optical element according to Claim 3, wherein said second resin layer comprises a polyimide which has been baked.

Claim 15 (Previously Presented) The liquid crystal optical element according to Claim 3, further comprising

a first electrically insulating layer which is coated on at least one of the electrodes and a second electrically insulating layer which is coated on the other electrode; and

wherein said first and said second resin layer are coated on said electrically insulating layer.

Claim 16 (Previously Presented) The liquid crystal optical element according to Claim 3, wherein said second resin layer is a non-alignment layer of a resin surface.

Claim 17 (Previously Presented) The liquid crystal optical element according to Claim 3, wherein said second resin layer prevents image-sticking.

Claim 18 (Previously Presented) The liquid crystal optical element according to Claim 1, wherein the liquid crystal layer exhibits reflection characteristics as if the liquid crystal layer is a mirror.

Claim 19 (Previously Presented) The liquid crystal optical element according to Claim 7, wherein said second resin layer comprises a polyimide which has been baked.

Claim 20 (Previously Presented) The liquid crystal optical element according to Claim 7, further comprising

a first electrically insulating layer which is coated on at least one of the electrodes and a second electrically insulating layer which is coated on the other electrode; and

wherein said first and said second resin layer are coated on said electrically insulating layer.

Claim 21 (Previously Presented) The liquid crystal optical element according to Claim 7, wherein said second resin layer is a non-alignment layer of a resin surface.

Claim 22 (Previously Presented) The liquid crystal optical element according to Claim 7, wherein said second resin layer prevents image-sticking.

Claim 23 (Previously Presented) The liquid crystal optical element according to Claim 5, wherein the liquid crystal layer exhibits reflection characteristics as if the liquid crystal layer is a mirror.

Claim 24 (Canceled)

Claim 25 (New): The liquid crystal optical element according to Claim 1, wherein the alignment of the liquid crystal in contact with the first and second resin layers is achieved without application of an electrical field.

Claim 26 (New): The liquid crystal optical element according to Claim 5, wherein the alignment of the liquid crystal in contact with the first and second resin layers is achieved without application of an electrical field.

Claim 27 (New): The liquid crystal optical element according to Claim 1, wherein said rubbed vertical alignment surface does not twist the liquid crystal at 240°.

Claim 28 (New): The liquid crystal optical element according to Claim 5, wherein said rubbed vertical alignment surface does not twist the liquid crystal at 240°.

BASIS FOR THE AMENDMENT

Claims 25 and 26 have been added as supported at pages 25-28 and by the Examples.

New Claims 27 and 28 have been added as supported at page 27, lines 5-7.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 1-8, 11-23 and 25-28 will now be active in this application.

INTERVIEW SUMMARY

Applicants wish to thank Examiner Duong for the helpful and courteous discussion with Applicants' Representative on March 8, 2005. During this discussion it was noted that West et al merely disclose that the resin layers on opposite substrates are rubbed in parallel or perpendicular with respect to each other. However, there is no disclosure or suggestion of a first resin layer having a rubbed vertical alignment surface in contact with the liquid crystal layer; and a second resin layer which is a non-alignment layer, a vertical alignment layer or a horizontal alignment layer.